



U.S. Department
of Transportation
**Federal Highway
Administration**

1200 New Jersey Ave., S.E.
Washington, DC 20590

December 6, 2007

In Reply Refer To:
HSSD/WZ-261

Mr. Shawn Kim
President
HUB International Trade/ACOPAN
210-1103, Samsan 2 Town, Samsan 2 Dong
Bupyeong-Gu, Incheon, 403-909
South Korea

Dear Mr. Kim:

Thank you for your correspondence requesting the Federal Highway Administration's (FHWA) acceptance of Acopan 2 mm, 3 mm, and 4 mm thick sign substrate. Accompanying your letter were product specification certificates and samples of the substrate. You requested acceptance of Acopan as a sign substrate for use with accepted sign stands on the National Highway System (NHS) under the provisions of the National Cooperative Highway Research Program (NCHRP) Report 350 "Recommended Procedures for the Safety Performance Evaluation of Highway Features."

Upon request, you provided samples of the Acopan sign substrate to the FHWA and a copy of the product specifications. The Acopan product specifications are enclosed. The Acopan sign substrate is a brand name of aluminum laminate material. The material properties of the 2 mm, 3 mm, and 4 mm Acopan substrate are nearly identical and considered to be equivalent to other previously accepted 2 mm, 3 mm, and 4 mm aluminum laminate sign substrates. Our records indicate that 2 mm, 3 mm, and 4 mm aluminum laminate signs have been successfully crash tested on portable stands made by a number of manufacturers and are limited to use on the tested and accepted stands. Therefore, the FHWA accepts the use of Acopan 2 mm, 3 mm, and 4 mm aluminum laminate sign substrates for use on the NHS under the range of conditions that equivalent materials have been tested and accepted, when proposed by a State.

Please note the following standard provisions that apply to the FHWA letters of acceptance:

- This acceptance is limited to the crashworthiness characteristics of the devices and does not cover their structural features, nor conformity with the Manual on Uniform Traffic Control Devices.



- Any changes that may adversely influence the crashworthiness of the device will require a new acceptance letter.
- Should the FHWA discover that the qualification testing was flawed, that in-service performance reveals unacceptable safety problems, or that the device being marketed is significantly different from the version that was crash tested, it reserves the right to modify or revoke its acceptance.
- You will be expected to supply potential users with sufficient information on design and installation requirements to ensure proper performance.
- You will be expected to certify to potential users that the hardware furnished has essentially the same chemistry, mechanical properties, and geometry as that submitted for acceptance, and that they will meet the crashworthiness requirements of the FHWA and the NCHRP Report 350.
- To prevent misunderstanding by others, this letter of acceptance, designated as number WZ-261, shall not be reproduced except in full. This letter, and the test documentation upon which this letter is based, is public information. All such letters and documentation may be reviewed at our office upon request.
- The Acopan material is a patented product and considered proprietary. If proprietary devices are specified by a highway agency for use on Federal-aid projects, except exempt, non-NHS projects, they: (a) must be supplied through competitive bidding with equally suitable unpatented items; (b) the highway agency must certify that they are essential for synchronization with the existing highway facilities or that no equally suitable alternative exists; or (c) they must be used for research or for a distinctive type of construction on relatively short sections of road for experimental purposes. Our regulations concerning proprietary products are contained in Title 23, Code of Federal Regulations, Section 635.411.
- This acceptance letter shall not be construed as authorization or consent by the FHWA to use, manufacture, or sell any patented device for which the applicant is not the patent holder. The acceptance letter is limited to the crashworthiness characteristics of the candidate device, and the FHWA is neither prepared nor required to become involved in issues concerning patent law. Patent issues, if any, are to be resolved by the applicant.

Sincerely yours,



George E. Rice, Jr.
Acting Director, Office of Safety Design
Office of Safety

Enclosure

~~FHWA:HSSD:MLupes:tb:x66994:11/29/07~~

~~File: s://directory folder/mlupes/WZ261 Acopan.doc~~

~~cc: HSSD (Reader, HSA; Chron File, HSSD; M.Lupes, HSSD
M.Bloschock, HSSD; M.McDonough, HSSD)~~

PHYSICAL PROPERTIES OF STANDARD PRODUCT

PROPERTY	STANDARD	UNIT	ACOPAN ACP	
			3mm/0.3	4mm/0.5
Specific gravity	ASTM D792		1.30	1.38
Panel weight	ASTM D792	Kg/m ²	3.83	5.46
Apparent thermal conductivity	ASTM C1363	Kcal/m.hr. °C	0.41	0.40
Deflection temperature	ASTM D648	°C	105	115
Modulus of elasticity (skin)	ASTM E8	N/mm ²	70,000	70,000

MECHACHICAL PROPERTIES OF STANDARD PRODUCT

PROPERTY	STANDARD	UNIT	ACOPAN ACP	
			3mm/0.3	4mm/0.5
Tensile strength	ASTM D638	N/mm ²	30	40
Elongation	ASTM D638	%	8	11
Flexural Rigidity	ASTM C393	(*105) N/mm ²	16	35
Flexural Modulus of Elasticity	ASTM D790	N/mm ²	25000	30000
Punching Shear Resistance	ASTM D732	N/mm ²	18	22

The technical information and suggestion for use and application presented herein represent the best information available to us and are believed to be reliable. We urge that user of our materials conduct confirmatory tests to determine final suitability for their specific end uses.

PAINT FINISH

DESCRIPTION	STANDARD	PROPERTIES
PVDF Paint Thickness (Microns)	ASTM D1400	≥24
Pencil hardness	ASTM D3363	Above 2H
T-bend	ASTM D4145	2 T
Cross Hatch Adhesion	ASTM-D3359-B	PASSES 100/100
Impact resistance	ASTM D2794	PASSES 27 Joules
Abrasion resistance	ASTM D4060	Max 32 mg.
Chemical resistance	ASTM D1308	PASSES
Detergent resistance	ASTM D2248	PASSES
Humidity resistance	ASTM D2247	PASSES
Salt spray resistance	ASTM B117	PASSES
Chalking resistance	ASTM D4214	PASSES
Colour retention (ΔE)	ASTM D2244	5.00 (maximum)
Gloss Retention	ASTM G153 & 154	50% (minimum)

Top Polyester: 15 microns (1 coat), Service coat: 5 to 7 microns